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THE EMOTIONAL REACTIONS OF COLLEGE GYMNASTS AS A FUNCTION OF TIME TO A MEET, LEVEL OF EXPERIENCE, AND LEVEL OF SUCCESS

A Thesis Presented

By

ROBERT M. KOENIG

Submitted to the Graduate School of the
University of Massachusetts in partial
fulfillment of the requirements for the degree of

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May 1974

Psychology

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May 1974

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Special thanks and appreciation goes to my dear friend Frank Cardamone who by being himself has given me so much. I also thank the gymnasts who participated in this study for tolerating my intrusion into a very important time for them.

ABSTRACT

35 male and 32 female gymnasts participated in this study to evaluate Epstein's theory of the inhibition of anxiety. Variables considered were level of experience, level of success and time until competition. 20 males and 20 females completed adjective checklists (ACL) and had their pulse rates recorded by hand one week, the day before, the day of, just before and after a meet. 30 males and 30 females rated their approach and avoidance tendencies retrospectively immediately after the meet. Results on the approach and avoidance questionnaires indicated that approach increases, and avoidance first increases, then decreases, as a function of time until the meet. Experience did not significantly affect ratings of either approach or avoidance. Ss of low success reported greater absolute levels of fear and anxiety on the ACL measures than Ss of high success. Ss of high success demonstrated steeper gradients of fear and anxiety than Ss of low success. This latter finding was contradictory to Epstein's theory. It was suggested that gymnastics unlike the parachuting studied by Epstein is not a highly stressful, life or death, situation, and therefore the development of an inhibition of anxiety occurs very early or not at all for the gymnast.

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INTRODUCTION

The athletic arena provides a valuable and relatively unexplored setting for research in the study of human emotionality. The participant in an athletic event ordinarily invests a great amount of time and energy in preparing to achieve a specific goal, therefore developing a high degree of personal involvement in the situation. Such a sense of involvement would be unobtainable in the artificiality of the laboratory situation and yet the rules, regulations and customs of the athletic contest provide a parallel to the experimental controls of laboratory research.

Epstein and Fenz (1962, 1965) have demonstrated the advantages provided by research in the athletic setting in their work concerning approach and avoidance conflicts in sport parachuting. They demonstrated a peaking of avoidance gradients before the time of a jump for experienced parachutists, while finding in inexperienced parachutists that avoidance ratings continued to increase up until the actual jump point. From these findings Epstein (1967) formulated a theory of the mastery of anxiety which postulated a process of inhibition of anxiety during threatening situations. It is assumed that the gradient of inhibition is steeper than the gradient of anxiety.

The sport of collegiate gymnastics was investigated by Knapp (1966) in an unpublished masters thesis with the in-

tention of evaluating the theory of Epstein and Fenz. Knapp's results demonstrated that an inverted V-shaped curve of avoidance existed for experienced gymnasts over a week long time dimension before a competition, while less experienced gymnasts showed an increasing gradient of avoidance for the same time period. Knapp's work, however, was based upon a small sample of women gymnasts and her only significant results emerged from the retrospective self-reports of her Ss. The present study was designed to investigate the anxiety reactions of gymnasts to competition with an adequate sample of Ss and concurrent as well as retrospective measures of anxiety.

This study tests Epstein's hypothesis that Ss with varying levels of experience react differentially in their reports of approach and avoidance responses to an anticipated stressful situation, in this case performing in a collegiate gymnastics competition. The same method of measuring approach and avoidance gradients first used by Epstein and Fenz (1965) and later by Knapp were utilized. In addition a series of adjective checklists presented to a group of Ss at various points in time before, during, and after a gymnastics meet provided information on the gymnasts' emotional reactions about their upcoming performance as they were occurring. This procedure enabled the comparison of data collected retrospectively with data collected during the actual time in question. As a supplement to this essentially subjective

type of data, the pulse rates of Ss were recorded to provide a more objective measure of emotionality.

In addition to the Ss' level of experience, the Ss' perceived level of success in competition was also examined. It was hypothesized that Ss with a higher perception of success would react differently from Ss with a lower perception of success, and would demonstrate similar trends as have been demonstrated when experience was used as an independent variable.

METHOD

Subjects

35 male and 32 female college gymnasts were used as subjects. All were volunteers and came from various Eastern colleges and universities. The majority of Ss in this study had participated in gymnastics throughout high school and were experienced competitors. This precluded the possibility of studying Ss with limited or no previous competitive experience. Of the 67 Ss in the study only 45 (23 males and 22 females) completed all experimental measures. An additional 22 Ss filled out approach and avoidance questionnaires.

The Ss' level of success was determined by their rating themselves on the question, "how successful have you been in gymnastics competition, considering all of the meets you have been in, up until now?" (see Appendix A for Personal Data Sheet). While Ss were given the option to rate themselves as very unsuccessful, unsuccessful, slightly unsuccessful, slightly successful, successful or very successful, most Ss rated themselves as either slightly successful or successful. Only 3 Ss rated themselves as slightly unsuccessful or worse (see Table 1 for Ss' ratings of their success in competition). The tendency for Ss not to rate themselves as unsuc-

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Insert Table 1 about here

Table 1

Number of Ss Reporting Different Levels of Success in Gymnastics Competition

Success Rating	Males	Females
Very Successful	1	1
Successful	11	9
Slightly Successful	11	9
Slightly Unsuccessful	0	3
Unsuccessful	0	0
Very Unsuccessful	0	0
Total	23	22

cessful in competition suggests that competition at the collegiate level of gymnastics requires a certain degree of competency. The amount of practice and the intensity of competition involved in gymnastics tend to create a process of selectivity which all but eliminates the unsuccessful competitor.

Materials

Several devices were utilized to measure the emotionality of gymnasts before, during, and after their performance in a gymnastics competition. An adjective checklist (ACL) was designed which included seven clusters of three words each describing what was considered to be emotional states relevant to a gymnastics competition. The clusters are:

Fear - frightened, scared, threatened
Conflict - conflicted, mixed feelings, ambivalent
Anxiety - nervous, jittery, tense
Energy - energetic, excited, stimulated
Competence - confident, secure, competent
Insecurity - worried, troubled, insecure
Eagerness - enthusiastic, eager, psyched

The single adjectives "keyed up" and "on edge" were also included in the adjective checklist. To the right of each adjective four spaces were provided for the Ss to report the degree to which each adjective described how they felt when

they thought about the gymnastics meet. These four spaces were labelled not at all, slightly, moderately and very much. (See Appendix B for the adjective checklist and instructions to Ss.)

An approach-avoidance questionnaire was developed based upon the questionnaire devised by Epstein and Fenz (1965) and almost identical to the one used by Knapp. The questionnaire consisted of two separate scales, one asking for the S's appraisal of his feeling of approach toward the meet and one asking for his feelings of avoidance toward the meet. Approach was defined as looking forward to the meet, wanting to go ahead, and feeling confident; avoidance as feelings of worry, concern, anxiety or apprehension about the meet, or wishing that one did not have to compete. On each of these scales were listed fourteen points in time which led up to and immediately followed the S's performance in the meet. (See Appendix C for questionnaire and instructions to Ss.)

Pulse Rates

Pulse rates of Ss were recorded as a physiological measure of arousal. They were taken by hand for a period of 30 seconds at each testing period.

Procedure

All Ss were told that the purpose of the study was to investigate anxiety and pre-meet tension in gymnasts. Four

days before a gymnastics meet at the beginning of a practice session Ss were given a personal data sheet to complete (see Appendix A for the personal data sheet). On this form they indicated the number of meets in which they had participated and gave their perception of how successful they had been in competition up until now. At the same time they filled out their first adjective checklist and had their pulse rates recorded. On the day before the meet Ss completed their second adjective checklist and had their pulses taken. The exact time of this particular session varied depending upon whether or not the Ss being tested were competing at a home meet or at a meet away. If the Ss were tested at their home campus, the time of testing was in the afternoon at approximately the same time as the first testing session. If the Ss were being tested at an away meet, the session took place in the evening. Most travelling gymnastics teams do not arrive at their destination until the evening, so this was the earliest time that testing could occur.

On the day of the meet, Ss filled out a third adjective checklist and had their pulses taken. This occurred one to two hours prior to competition when Ss first arrived at the gymnasium. A fourth pulse reading was taken after the warm-up period just before the meet began. Shortly after the meet Ss filled out two adjective checklists; one indicating retrospectively how they felt just before they first performed and one indicating how they felt currently, just after the meet.

A final pulse reading was also taken at this time. Finally, all Ss completed an approach-avoidance questionnaire. If the Ss were performing in more than one event in the meet, they were instructed to consider only their first performance when filling out the scales. They were also told to keep the ratings of approach and avoidance as independent as possible.

Ss were instructed to give a rating of 1 to 10 to these fourteen points in time, first in terms of strength of approach and then in terms of strength of avoidance. Ss were to select the time of strongest approach and give it a value of 10 and then select the time of weakest approach and give it a value of 1. Having defined their range of reactions, they were then told to score the remaining points in relation to these extreme points. It was also permissible to use the same number more than once for points of equal intensity. After completing their ratings of approach, Ss were instructed to repeat the same procedure for avoidance.

RESULTS

Analysis of Adjectives

It was necessary for the Ss' responses to the adjective checklists to be transformed into numerical scores for analysis. If the S rated an adjective as 'not at all' it received a score of 1; if it was rated as 'slightly' it received a score of 2; if it was rated as 'moderately' it received a score of 3; and if it was rated as 'very much' it received a score of 4. This procedure preserved the relative magnitude of the Ss' ratings of the adjectives and allowed the scores of the three words comprising an adjective cluster to be averaged into a single score. For example, if a S rated the adjective 'frightened' as not at all, 'scared' as slightly, and 'threatened' as moderate, then the score for "fear" was 1 + 2 + 3 divided by 3 which gives a score of 2. This procedure was followed for all seven clusters on each adjective checklist filled out by the Ss. The single adjectives 'keyed up' and 'on edge' received a score of 1, 2, 3, or 4 depending upon the Ss' rating of each word. There were a total of nine measures available for analysis from the adjective checklists, seven clusters and two individual adjectives.

The data from the adjective checklists were treated with an analysis of variance with two between variables (level of success and sex of S) and one within variable (points in time).

The Ss were divided into two levels of success according to the following criteria:

Group 1 - Ss of low success. Includes Ss who rated themselves as slightly successful or unsuccessful.

Group 2 - Ss of high success. Includes Ss who rated themselves as successful or very successful.

This division of Ss by success made available for analysis 11 males of low success, 12 males of high success, 12 females of low success, and 10 females of high success (see Table 1). In order to maintain an equal number of Ss in the experimental groups 1 male of low success, 2 males of high success, and 2 females of low success were randomly discarded from the subject sample. This procedure equalized the number of Ss in each group to 10 males and 10 females, leaving a total of 40 Ss available for the analysis of ACL measures.

The results from the analysis of adjectives indicated a significant difference for seven of the nine measures as a function of time. Only "conflict" and "competence" failed to achieve significance. Table 2 lists the F values and means for the time variable for all significant ACL measures. The

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Insert Table 2 about here

ACL measures showing the greatest change over time were "anxiety" and "fear". Figure 1 illustrates the changes in the mean rating of "anxiety" as a function of time. It can be

Table 2

Means and F Values for the Time Variable for All Significant ACL Measures

	df	F	p	Week Before	Day Before	Day of	Just Before	After
Fear	4,144	15.52	<.001	1.8	1.7	1.8	1.9	1.2
Conflict	4,144	.93	ns	2.0	2.0	2.0	2.0	1.8
Anxiety	4,144	27.75	<.001	2.3	2.1	2.6	2.7	1.6
Energy	4,144	6.3	<.001	3.0	3.0	3.2	3.5	2.9
Competence	4,144	1,14	ns	2.6	2.7	2.6	2.7	2.8
Insecurity	4,144	9.8	<.001	1.8	1.9	1.9	2.0	1.4
Eagerness	4,144	8.0	<.001	3.1	3.0	3.2	3.5	2.8
Keyed-up	4,144	15.67	<.001	1.9	1.9	2.3	2.5	1.4
On edge	4,144	5.34	<.001	2.4	2.5	2.9	3.0	2.4

Insert Figure 1 about here
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seen in Figure 1 that anxiety drops slightly the day before the meet and increases thereafter until after the meet when there is a drop. All significant ACL measures demonstrated an increase over time from the day before to just before the meet except "insecurity". The ratings for "insecurity" remained the same on the day before and the day of the meet and increased slightly just before the meet.

It can be observed in Table 3 that Ss of high success reported greater "energy", "competence" and "eagerness" than Ss of low success. Ss of low success reported greater "fear" and "insecurity" than Ss of high success.

Insert Table 3 about here

The variable of sex accounted for a significant difference in Ss' ratings on five ACL measures. Table 4 gives the means and F values for the sex variable for all significant ACL measures. The mean ratings for "fear", "conflict", "insecurity" and "on edge" were all significantly smaller for males than females. Females reported lower "competence" than males.

Insert Table 4 about here

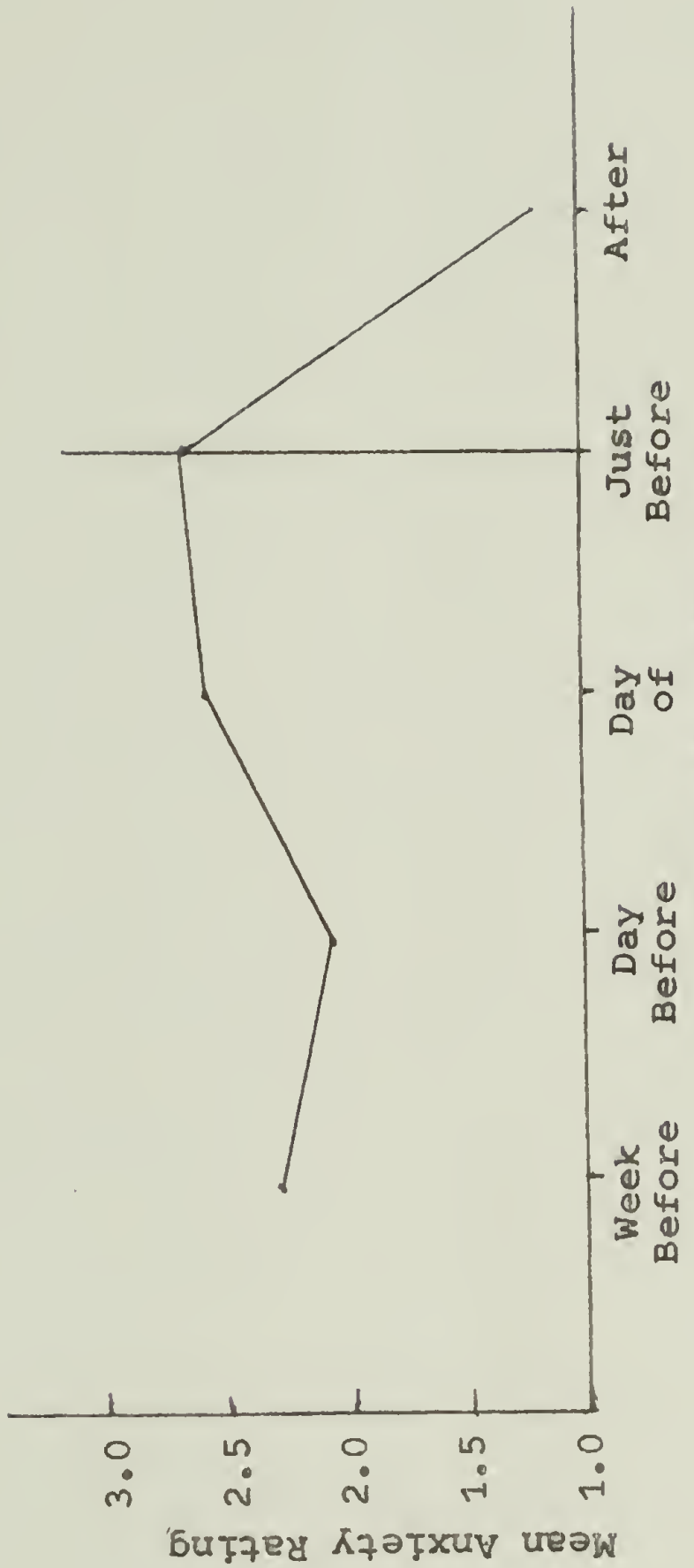

Figure 1. Mean Ratings of "Anxiety" Adjectives as a Function of Time

Table 3

Means and F Values for the Success Variable for All Significant ACL Measures

	df	F	p	Level of Success	
				Low	High
Fear	1,36	7.21	.025	1.9	1.5
Conflict	1,36	4.13	ns	1.8	2.1
Anxiety	1,36	1.67	ns	2.3	2.1
Energy	1,36	6.33	.025	2.9	3.3
Competence	1,36	5.62	.025	2.5	2.9
Insecurity	1,36	9.60	<.01	2.0	1.6
Eagerness	1,36	8.82	<.01	2.9	3.3
Keyed up	1,36	.95	ns	1.9	2.1
On edge	1,36	6.61	.025	2.4	2.9

Table 4

Means and F Values for the Sex Variable for All Significant ACL Measures

	df	F	p	Sex	
				Male	Female
Fear	1,36	5.62	.025	1.5	1.9
Conflict	1,36	4.13	.05	1.8	2.1
Anxiety	1,36	1.61	ns	2.4	2.1
Energy	1,36	.01	ns	3.1	3.1
Competence	1,36	9.49	<.01	2.9	2.5
Insecurity	1,36	5.68	.025	1.6	1.9
Eagerness	1,36	.04	ns	3.1	3.1
Keyed up	1,36	.24	ns	2.0	2.0
On edge	1,36	6.61	.025	2.3	2.9

Several significant interactions emerged from the analysis of the adjectives. For the "fear" adjectives the interaction of success and time proved to be significant at the .01 level (df = 4,144; F = 3.37). Listed in Table 5 are the mean ratings of fear as a function of success and time. Figure 2 illustrates the change of mean ratings of "fear" as a function of success and time.

Insert Table 5 and Figure 2 about here

In Figure 2 it can be seen that there is a slight tendency for a peaking back in "fear" to occur for the low success group and there is a marked increasing gradient for the high success group.

Figure 3 is a graph for the mean ratings of "anxiety" as a function of success and time. While there is a drop in mean ratings of anxiety the day before the meet for the low success group, the ratings of anxiety for the high success group steadily increases as the meet approaches. Table 6 lists the mean ratings of "anxiety" as a function of success

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Insert Figure 3 and Table 6 about here

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and time. Table 6 also indicates that the net difference between the means for the high and low success groups decreases as the meet approaches until they become almost equal after

Table 5

Mean Ratings of "Fear" Adjectives as a Function of Success and Time

Level of Success	Week Before	Day Before	Day of	Just Before	After
Low Success	2.0	1.9	2.2	2.1	1.2
High Success	1.5	1.4	1.5	1.8	1.2
Difference	0.5	0.5	0.7	0.3	0.0

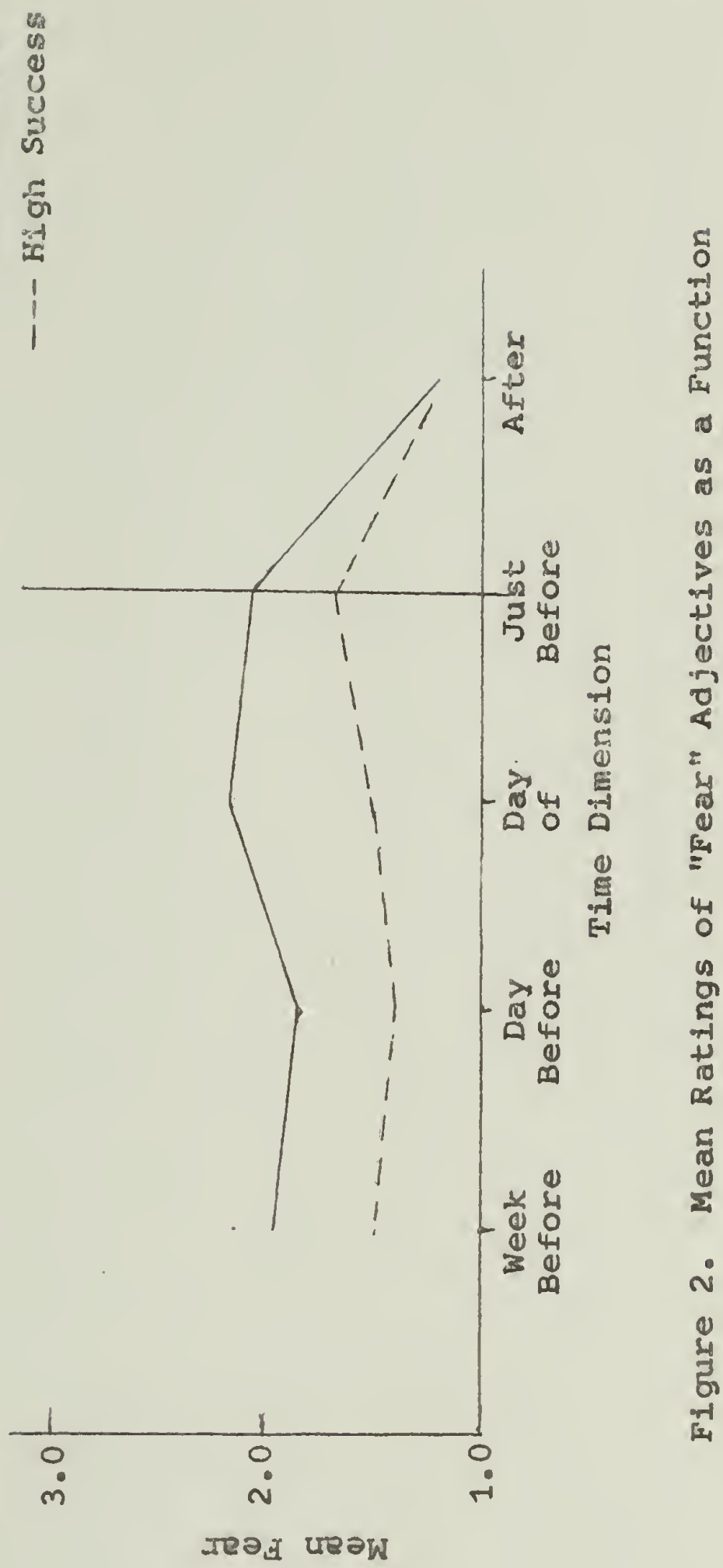

Figure 2. Mean Ratings of "Fear" Adjectives as a Function of Success

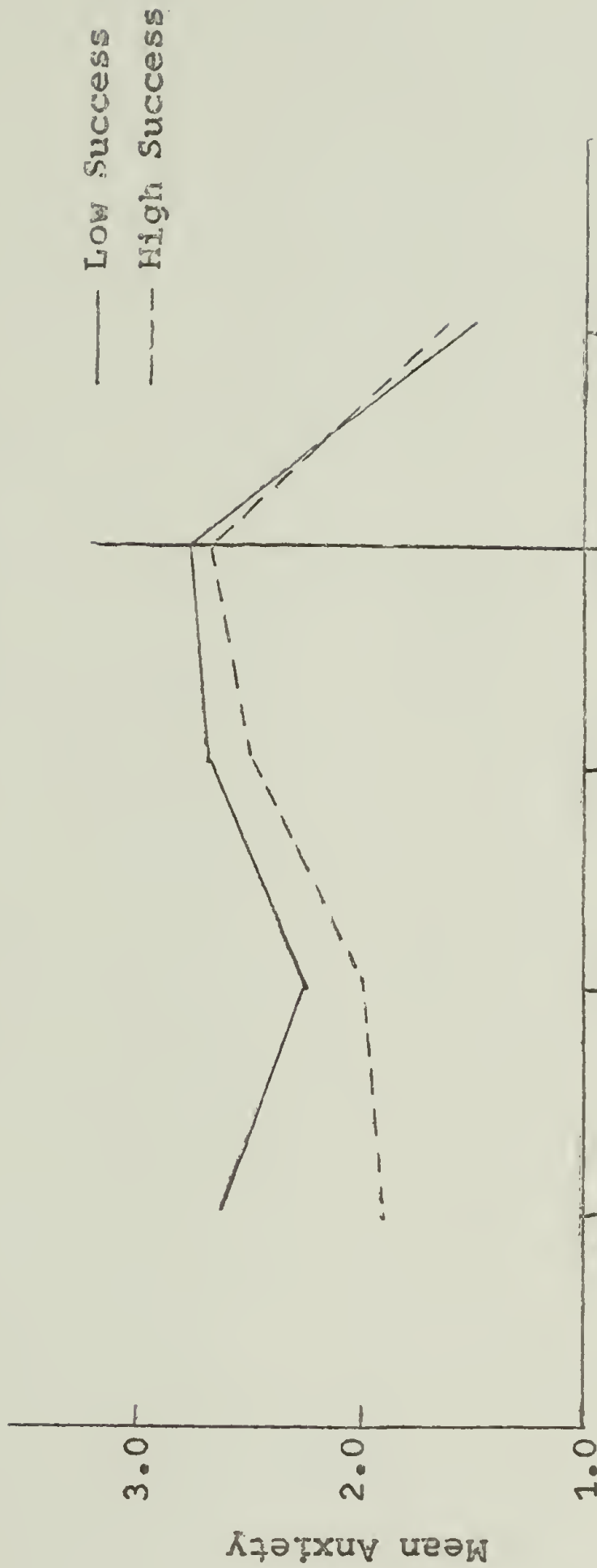

Figure 3. Mean Ratings of "Anxiety" Adjectives as a Function of Success

Table 6

Mean Ratings of "Anxiety" Adjectives
as a Function of Success

Level of Success	Week Before	Day Before	Day of	Just Before	After
Low Success	2.6	2.3	2.7	2.8	1.5
High Success	1.9	2.0	2.5	2.7	1.6
Difference	0.7	0.3	0.2	0.1	-0.1

the meet. The interaction of success and time for "anxiety" reached statistical significance at the .025 level (df = 4; $\underline{F}$ = 2.55). It may be concluded that the low success group reports greater anxiety than the high success group at all points in time, but particularly at the earliest period.

Table 7 gives the mean ratings for "competence" as a function of sex and success. It is apparent from Table 7

Insert Table 7 about here

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that the mean ratings of "competence" are much lower for females of low success than the almost equal mean ratings given by the other three experimental groups (females of high success, males of low success, and males of high success). The fact that females of low success rated "competence" much lower than the females of high success accounts for the previously reported finding that females rated themselves lower in competence than males (see Table 4 for ratings of "competence" as a function of sex). The interaction of sex and success for "competence" was significant at the .05 level (df = 1.36; $\underline{F}$ = 4.71).

The second order interaction of success x sex x time for the "eagerness" adjectives showed statistical significance at the .025 level (df = 4,144; $\underline{F}$ = 2.79). Given in Figure 4 is the representation of this interaction. For the females of low success, as the meet approaches there is a decrease in re-

Table 7

Mean Ratings of "Competence" Adjectives
as a Function of Success and Sex

Sex	Level of Success	
	Low	High
Male	2.9	2.9
Female	2.2	2.8
Difference	0.7	0.1

Insert Figure 4 about here
---

ports of "eagerness" up until the day of the meet. For the males of low success and the females of high success the ratings for "eagerness" increase up until the actual competition. For the males of high success the ratings for "eagerness" increase until the day of the meet.

For the purpose of estimating approach and avoidance trends from the ACL measures, "eagerness" and "fear" were chosen. "Eagerness" was considered most representative of approach and "fear" most representative of avoidance. Figure 5 gives the ratings of these measures pooled over Ss. It can

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Insert Figure 5 about here
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be seen that while both increase as the meet approaches, "eagerness" shows a steeper gradient. This suggests that the gradient of approach is steeper than the gradient of avoidance. In order to test this, net "eagerness" was compared to net "fear" by subtracting the first point (week before) from the last point (just before) in the anticipatory period. An analysis of variance indicated that net "eagerness" ($\bar{u}$ = .46) was greater than net "fear" ($\bar{u}$ = .18), but only at the .10 level of significance (df = 1.36; F = 4.12).

It was noted previously that only 45 of the 67 Ss par-

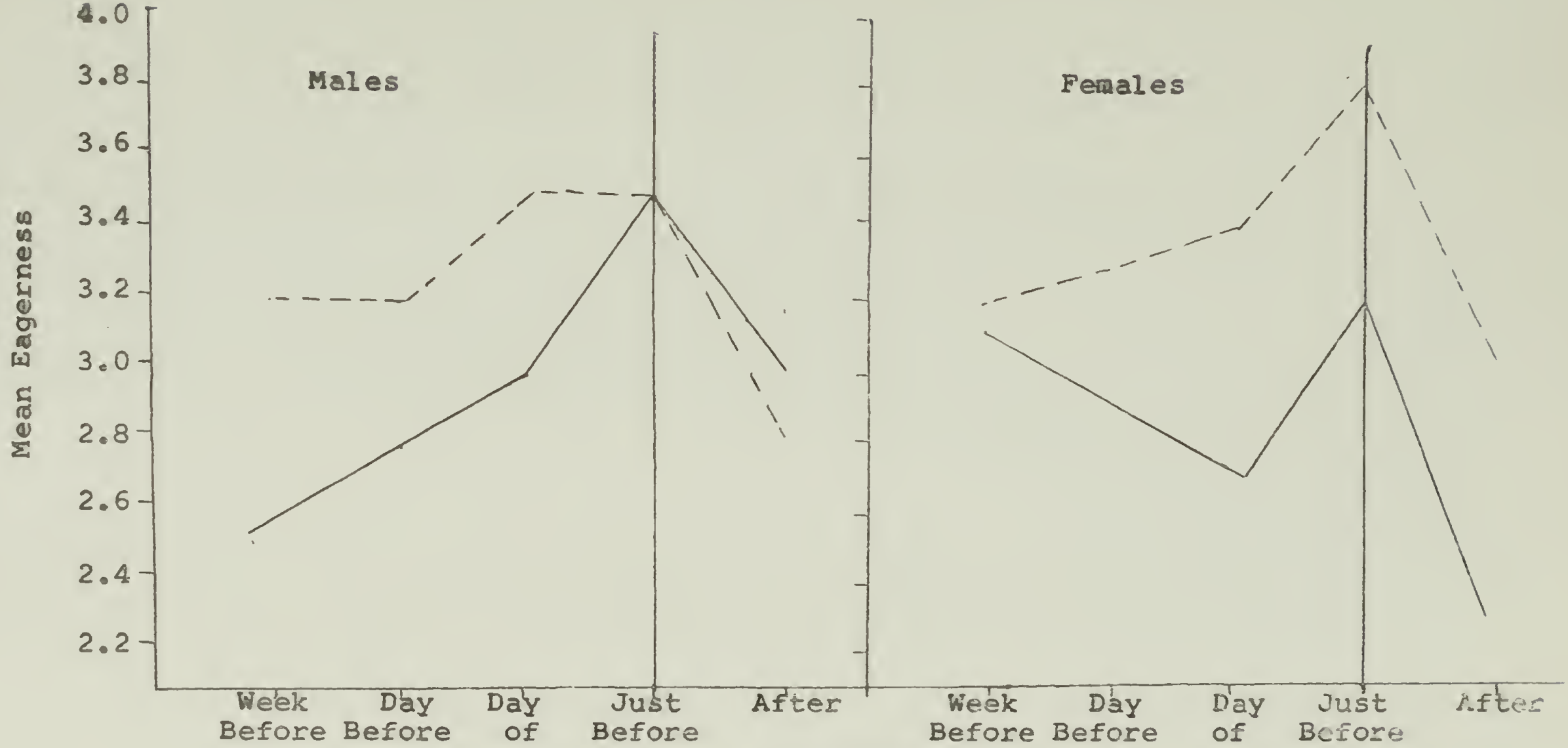

Figure 4. Mean Ratings of "Eagerness" Adjectives as a Function of Success and Sex

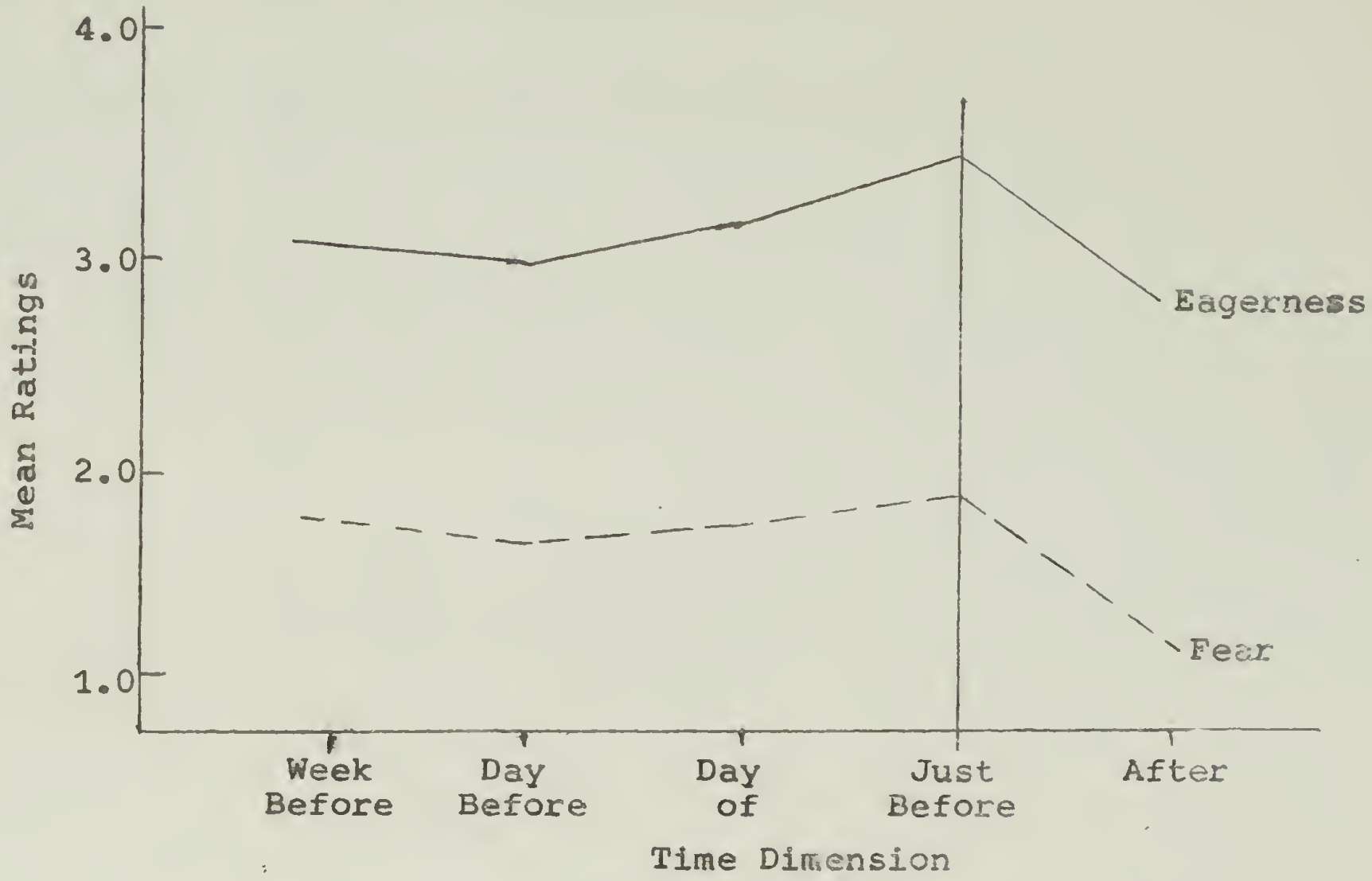

Figure 5. Mean Ratings of "Eagerness" and "Fear" Across Ss as a Function of Time

ticipating in this study completed all adjective checklists. The majority of these Ss were so highly experienced in gymnastics competition, that it was impossible to break Ss into sufficiently different experience levels. This made analysis of ACL measures as a function of experience impossible.

Analysis of Approach and Avoidance Ratings

The approach and avoidance questionnaires required Ss to rate fourteen points in time according to the relative strength of approach and avoidance they experienced at those times. Upon inspection of the data, the decision was made to pool these points into seven groupings to achieve a more reliable and smoother representation of apparent trends. The points were pooled in the following manner:

1 - 5-7 days before meet

2-4 - Night before
Morning of
Upon arrival at building

5-7 - Putting on uniform
During warmups
Waiting for event to be announced

8-10 - Immediately after hearing event announced
Walking to starting point
Waiting for signal to begin

11 - Receiving nod to begin

12-13 - Upon first beginning performance of event
Toward end of performance of event

14 - Immediately after event

An analysis of variance with two between variables (level of experience and sex of S) and one within variable (points in time) was used for the analysis of the approach and avoidance data. The Ss' level of experience was based upon the number of gymanstics meets they had participated in since they began competing in gymnastics. Ss of low experience were considered those who had been in less than 20 meets, Ss of medium experience were those who had been in 21 to 35 meets, and Ss of high experience were those who had been in 36 to 100 meets. Ten males and ten females were in each of the three levels of experience giving a total of 60 Ss for the analysis.

The analysis of approach ratings indicated a significant difference across groups over time (df = 6,324; F = 13.91) at the .01 level. There were no significant effects associated with level of experience or sex (see Appendix D for ratings of Approach as a function of experience).

The analysis of avoidance revealed a significant difference across groups over time (df = 6,324; F = 4.34) at the .01 level. As in the analysis of approach there were no significant effects associated with level of experience or sex (see Appendix D for ratings of Avoidance as a function of experience).

Figure 6 presents Ss' ratings of approach and avoidance collapsed across groups over time. Approach ratings demon-

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Insert Figure 6 about here

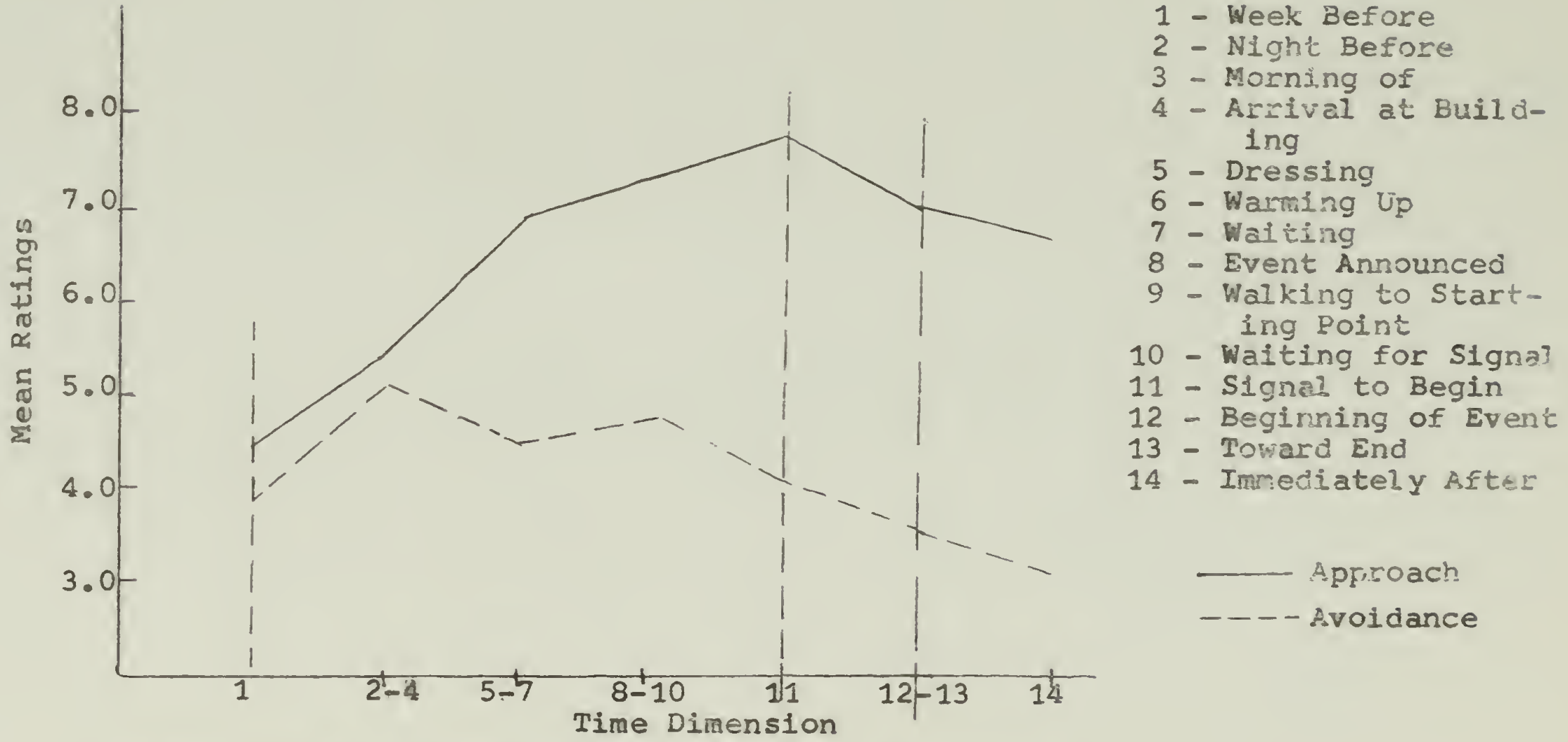

Figure 6. Mean Ratings of Approach and Avoidance Across Ss as a Function of Time

strated an increasing gradient up to receiving the nod to begin. After beginning a decrease in approach occurred. Avoidance demonstrated a peaking at point 2-4, dropped at point 5-7, increased slightly at point 8-10, and then dropped to point 14. The peak of avoidance at point 2-4 occurred just before Ss began to physically prepare for the competition. Figure 6 demonstrates that at no time was avoidance greater than approach.

An analysis was also done which treated approach and avoidance as a within Ss variable. Ss' ratings of approach proved to be significantly greater than their ratings of avoidance at the .001 level (df = 1,54; F = 126). The group mean for approach was 6.6 and the group mean for avoidance was 4.1.

An analysis of approach and avoidance was also performed treating level of success as a between Ss variable. There were no significant effects associated with level of success.

Analysis of Pulse Rates

The pulse rates showed an increasing trend from the week before to just before the meet and then decreased after the meet.

An analysis of variance with two between variables (level of success and sex of S) and one within variable (points in time--week before, day before, day of, just before, and after meet) was performed upon the data from the pulse rates.

A total of 10 males and 10 females were in each level of success. There was a significant difference at the .01 level (df = 4,144; $\underline{F}$ = 80.57) for the variable of "time". There were no differences associated with either sex or level of success. Given in Figure 7 are the mean pulse rates over

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Insert Figure 7 about here
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time. Just before the meet $\underline{S}$s had just completed a very vigorous warming-up period prior to the competition. This physical exertion did not occur at any of the other time points and the extreme pulse rates recorded at this time were probably a consequence of this warm-up. It was decided to repeat the analysis of pulse rates and exclude the 'just before' period. In this analysis time continued to reach significance at the .01 level (df = 3,108; $\underline{F}$ = 31.42).

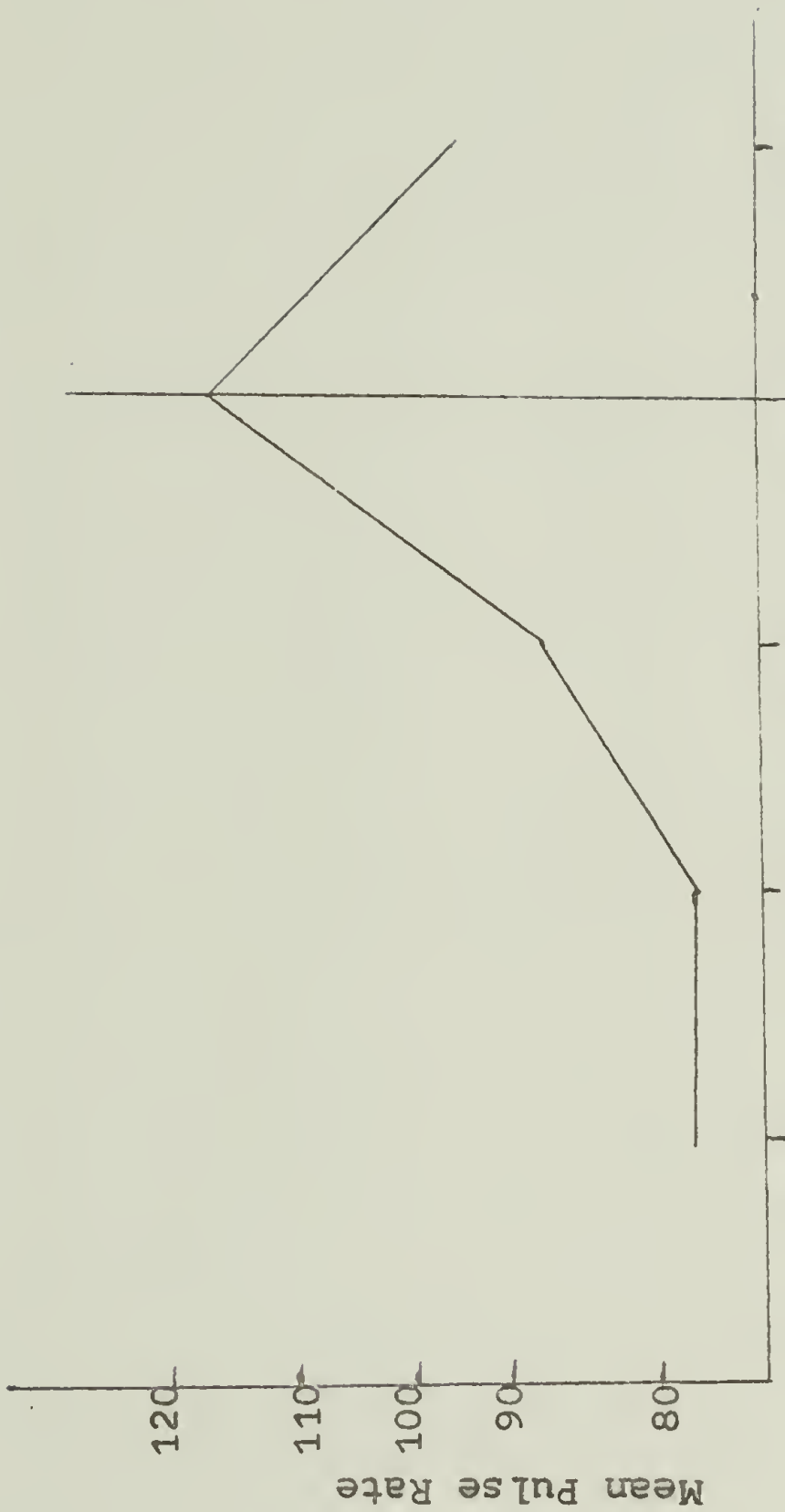

Figure 7. Means of Pulse Rates as a Function of Time

DISCUSSION

Implications of Findings for the Hypotheses Proposed

An inverted V-shaped curve of avoidance was found for the pooled sample of Ss, but there was no evidence for ratings of avoidance to vary as a function of experience. This fails to support Knapp's findings of an increasing gradient of avoidance for less experienced Ss and an inverted V-shaped curve only for experienced Ss. The experimental designs in both studies included low, medium, and high experience groups. Knapp's lowest group consisted of novice Ss who competed in none or one gymnastic meet, her medium group consisted of Ss who competed in from 2 to 10 meets, and her experienced group consisted of Ss who competed in from 11 to 40 meets. In the present study the lowest experience group consisted of Ss who had competed in from 1 to 20 meets, therefore accounting for almost the total range of experience levels of Knapp's sample.

On the basis of this fact is was postulated that the absence of a significant difference along the experience variable in the present study was the result of the higher experience of Ss. This suggested that the transition from an increasing gradient of avoidance to an inverted-V may occur very early in the gymnast's career. Knapp's data indicates that this inhibition of anxiety tends to occur before the S's

tenth competitive experience. As a means of verifying this hypothesis, the avoidance gradients of four Ss with limited experience (4 to 9 meets) were selected for investigation. In order to provide a fair comparison with Knapp's study, all Ss chosen were female. When the avoidance gradients for these Ss were pooled an inverted V-shaped curve was produced (see Figure 8 for mean avoidance ratings of the four inexperienced female Ss). These results fail to support the existence of an increasing gradient of avoidance for even very inexperienced Ss.

Insert Figure 8 about here

The hypothesis that the emotional reactions of Ss vary as a function of their success in competition was supported, but only in the analysis of measures derived from the adjective checklists. It was also hypothesized that Ss of high success would demonstrate an inhibitory gradient of anxiety as Ss of high experience had demonstrated. Contrary to these expectations, on the adjective checklists Ss of high success reported steeper gradients of both anxiety and fear than Ss of low success. Assuming that success is similar to experience, the results are in opposition to Epstein's theory, on the basis of which it was predicted that Ss high in success would decrease in fear and anxiety as the meet approached.

It is, of course, possible that the variable of self-

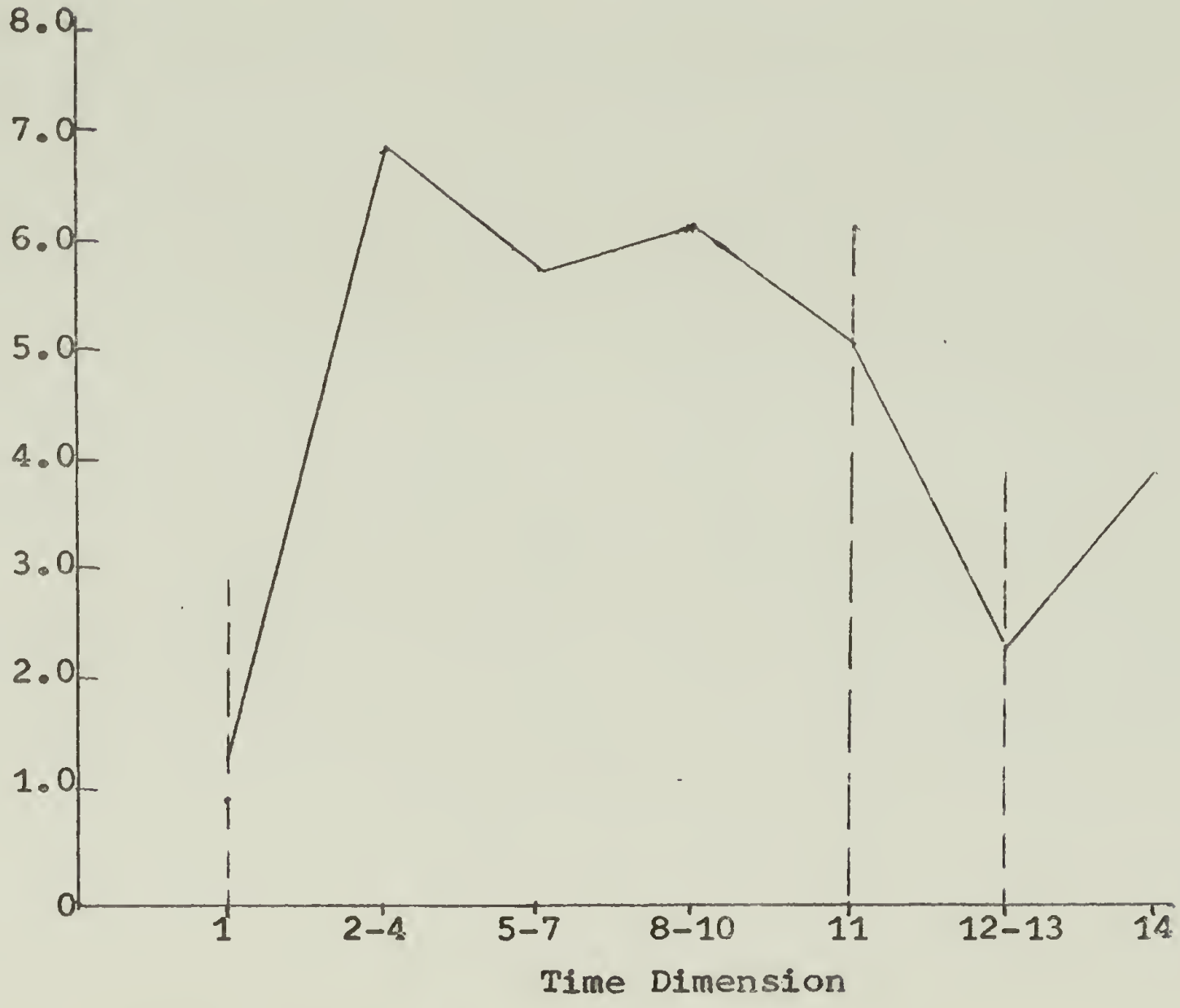

Figure 8. Mean Ratings of Avoidance for Four Inexperienced Female Ss

perceived success is not equivalent to level of experience. However, it seems extremely unlikely that these variables are so different that they would produce significant results in the opposite direction. The differences in the nature of gymnastics and the more stressful sport of parachuting may provide some insight into these discrepant findings. Unlike parachuting, gymnastics is not a life or death endeavor, and the anxiety evoked by gymnastics pertains more to performing well than to risking one's life. Phenomenologically, the anxiety aroused in a parachute jump derives from the possibility of a biologically threatening experience (e.g., violent death), whereas the anxiety aroused prior to a gymnastics performance is more psychologically threatening (e.g., the loss of self-esteem through poor performance). The minimalization of anxiety in parachuting is, therefore, more crucial in terms of organismic survival than in gymnastics.

In a related study on the presentation of a speech by Boudreau and Epstein (1970) an overall heightening of the avoidance gradient was found for the most experienced group. It was concluded that "what one does when giving a speech, and the reception it receives, are more complicated and unpredictable than what happens in a parachute jump" (p. 22). This finding seems to parallel the increase in anxiety reported by Ss of high success in the present study.

Pervasive anxiety would be potentially more disruptive to the actual performance of gymnastics than to a parachute

jump. The fine muscular coordination involved in gymnastics movements could be seriously jeopardized if the level of anxiety became too extreme. The absolute level of anxiety and fear reported by Ss is, in fact, always greater for the low success group throughout the entire anticipatory period. The lower level of anxiety in the high success group suggests that they have mastered extreme states of anxiety. The inverted-V may be reached much earlier or bypassed altogether in gymnastics because of its lower level of threat than parachuting.

The view that an optimal level of anxiety is required for optimal performance (Morgan, 1970) suggests one explanatory concept for the finding that Ss of high success report a steeper gradient of fear and anxiety. Ss of high success, having mastered extreme anxiety states, no longer experience the anxiety that Ss of low success experience prior to competition. Therefore the anxiety that they do experience occurs relatively shortly before their performance and quickly builds to an optimal level. Some competitors are acutely aware of the need for some level of anxiety prior to performance. One S of high success remarked, "If I don't get nervous, I start to become worried about how well I will perform." So it seems that the absence of a small, but noticeable buildup of anxiety may signify to the performer a psychological unreadiness for competition.

Additional Findings

There were several findings in this study not directly related to the hypotheses proposed which further the understanding of the gymnast facing competition. A number of ACL measures, such as "eagerness", "competence", and "energy", are strongly connotative of positive or approach tendencies towards the competition. Several ACL measures, such as "anxiety", "insecurity", and "fear", are strongly connotative of negative or avoidance feelings about the competition. As can be observed from Table 2, there was a very apparent trend for the positive connotative adjectives to be rated higher than those adjectives of negative connotation. There was never a time in the study in which even one rating of a negatively tinged adjective was greater than the lowest rating of "energy", "competence", or "eagerness". Most gymnasts apparently consider competition in a meet to be more of a positive emotional experience than a negative one.

It is particularly interesting that all ACL measures, regardless of any positive or negative emotional connotation associated with them, increased as a function of time until the meet (see Table 2). Pulse rate, a physiological measure of arousal, demonstrated this same trend as the meet neared. The ACL measures must be reflective of an increase in arousal as well. This is in accord with the activation theory of emotion which recognizes the close relationship between emotion and arousal elicited by an anticipated performance

(Cofer and Appley, 1964).

According to the model of conflict postulated by Miller (1959) it is assumed that the gradient of avoidance is steeper than the gradient of approach. This assumption leads to the expectation that Ss will make stronger approach responses at a distance than close to the meet. On the approach and avoidance questionnaire, as well as on the ACL ratings of "eagerness" and "fear", the pooled Ss showed a steep gradient of approach and a flattened gradient of avoidance. This indicates that Ss experienced a greater desire to compete when close to the meet than at a distance. These findings are opposite to those in parachuting (Epstein and Fenz, 1965) in which net approach decreased as a function of time until the jump. Miller's model of approach and avoidance conflict is, therefore, not supported by the results of this study.

The recent surge of interest in the role of women in athletics makes several findings as a result of sex differences of special interest. While ratings of "energy" and "eagerness" were not significantly different for males and females, the ratings of "competence" for males was significantly greater than for females. No differences for "anxiety" were reported between the sexes, but the measures for "fear", "conflict", and "insecurity" were all significantly greater for the females in the study.

These findings suggest that males may have a slight edge in their ability to cope with the stress of an upcoming com-

petition. There were, however, two significant interactions emerging from the study which casts some doubt upon this generalization. When "competence" was analyzed as a function of sex and success it was found that the low success group of females was responsible for the lower "competence" scores for the pooled group of female Ss (see Table 7). Females of high success rated their competence as high as males of high success and slightly higher than males of low success. The "eagerness" adjectives also provided a revealing difference in scores as a function of sex and success. The low success males and the high success groups for both sexes demonstrated increasing feelings of eagerness as the meet approached. However, the females of low success dropped in their ratings of eagerness from the week before the meet until the day of the meet (see Figure 4).

It seems reasonable to conclude from these and other findings in this study that the successful woman gymnast reports emotional reactions to competition which are almost indistinguishable from those of the male athlete. She is eager to compete, feels highly competent, and experiences no more anxiety than her male counterpart. The less successful woman, reacting somewhat differently, does report feelings of lower competence and diminishing eagerness as she faces a meet. Cultural influences undoubtably contribute to the divergent reactions of the less successful woman gymnast. In our culture women are discouraged from participating in

athletics, and as Boslooper and Hayes (1973) point out, are taught to consider competition as unfeminine. Perhaps the interplay of this cultural norm and the only moderate success these women experience in competition makes them less competent and eager to perform. Following the same reasoning, the woman who is successful in competition no longer subscribes to the female stereotype having proven it incorrect.

It is possible that the males of low success are in reality the divergent group in comparison to the other experimental groups. It must be recalled that success was a self-rated measure in this study. Therefore, women admitting low success and low competence were more consistent in their relative ratings than males who rated themselves low in success, but high in competence. Perhaps males who are not highly successful in competition refuse to admit to feelings of incompetence or uneagerness to compete.

The relationship between sex differences, culture and emotionality in athletics is unfortunately not well researched at present. With the increased interest in the role of women in sports, however, some of the issues raised by this study may be soon more fully understood.

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APPENDICES

APPENDIX A

Personal Data Sheet

Name_____

1. Total number of years of competition _____

2. Type and years of competition:

   Years High School Competition _____

   Years College Competition _____

   Years Other _____ (Please explain fully)

3. Approximately number of meets competed in, including high school:_____

4. Events that you will be competing in for the meet you are reporting:

   a. d.

   b. e.

   c. f.

5. Which meet of the season is this for you? Please circle

   1 2 3 4 5 more than 5

6. How successful have you been in gymnastics competition, considering all of the meets you have been in, up until now?
   Check the appropriate space:

Very Unsuccessful	Unsuccessful	Slightly Unsuccessful	Slightly Successful	Successful	Very Successful

APPENDIX B

NAME_____

DATE OF FILLING OUT FORM_____

TIME_____

DATE OF MEET_____

SCHEDULED TIME OF MEET _____

*ANTICIPATED TIME OF YOUR FIRST ROUTINE_____

FORM FILLED OUT:

____Week before meet

____Day before meet

____Day of meet (before)

____Immediately before routine (retro)

____Shortly after meet

Please check the appropriate boxes below to indicate the degree to which each adjective describes how you feel when you think about the meet in question. Work rapidly, first impressions are as good as any.

	Not at all	Slightly	Moderately	Very Much
worried				
enthusiastic				
threatened				
jittery				
energetic				
confident				
tense				
troubled				
secure				
conflicted				
competent				
ambivalent				
stimulated				
scared				
on-edge				
eager				
mixed-feelings				
"psyched"				
frightened				
excited				
nervous				
insecure				
keyed-up				

APPENDIX C

SUBJECTIVE RATING INSTRUCTION SHEET

NAME:

DATE:

OPPONENT:

I would like to know how you felt about today's gymnastic meet, i.e., when you had your maximum "approach", and fear or "avoidance", feelings. Consider approach as looking forward to the meet, wanting to go ahead, feeling confident; avoidance, as feelings of worry, concern, anxiety or apprehension about the meet, or wishing that you did not have to compete.

When you turn the page, you will find listed a sequence of 14 events which led up to, and immediately followed today's meet. You are to give a score from 1-10 to these 14 spans of time in terms first of the strength of your approach (page 2), and then later in terms of avoidance (page 3). It is necessary to try to keep each independent from the other. It is possible to feel both approach and avoidance at the same time. For example, you could have a strong feeling of approach and a tinge of wrroy, or both could be high.

First select the time of your strongest approach, and give it a value of 10 by placing a check in the appropriate square. Then select the time of your weakest approach, and give it a value of one. (The same number may be used more than once for equal feelings.) Having defined your strongest and weakest reactions with this ten point scale, score all the other points between one and ten; then do the same for avoidance.

APPROACH:

How much did you look forward to the meet and desire to engage in the competition? Please indicate by checking the proper squares.

	weakest approach 1	2	3	4	5	6	7	8	9	strongest approach 10
1. 5-7 days before meet										
2. Night before										
3. Morning of										
4. Upon arrival at building in which meet is to be held										
5. Putting on uniform										
6. During warm-ups										
7. Waiting for your event to be announced										
8. Immediately after hearing your event announced										
9. Walking to starting point										
10. Waiting for signal to begin										
11. Receiving nod to begin										
12. Upon first beginning performance of your event										
13. Toward end of performance of your event										
14. Immediately after your event										
	1	2	3	4	5	6	7	8	9	10

AVOIDANCE:

How anxious or apprehensive did you feel about today's meet or have the wish that you did not have to compete? Please indicate by checking the proper squares.

	weakest avoidance 1	2	3	4	5	6	7	8	9	strongest avoidance 10
1. 5-7 days before meet										
2. Night before										
3. Morning of										
4. Upon arrival at building in which meet is to be held										
5. Putting on uniform										
6. During warm-ups										
7. Waiting for your event to be announced										
8. Immediately after hearing your event announced										
9. Walking to starting point										
10. Waiting for signal to begin										
11. Receiving nod to begin										
12. Upon first beginning performance of your event										
13. Toward end of performance of your event										
14. Immediately after your event										
	1	2	3	4	5	6	7	8	9	10

NAME_____

In general, how do you feel about your performance at this meet? Check the appropriate space below:

Very Disap-pointed	Disap-pointed	Slightly Disap-pointed	Slightly Pleased	Pleased	Very Pleased

Do you practice any specific techniques to control pre-meet tension? If so, please describe them, noting how effective they are for you:

APPENDIX D

Mean Ratings of Approach and Avoidance as a Function of Experience and Time

Approach

Level of Experience	1	2-4	5-7	8-10	11	12-13	14 *
Low	4.6	6.4	6.9	7.2	8.2	8.1	7.5
Medium	4.6	5.2	6.9	7.5	8.0	6.9	5.7
High	4.1	5.0	7.1	7.3	7.4	7.4	7.1

Avoidance

Level of Experience	1	2-4	5-7	8-10	11	12-13	14 *
Low	4.2	4.5	4.4	4.5	4.0	3.7	3.6
Medium	3.5	5.1	4.8	5.5	4.7	3.4	2.8
High	3.9	5.7	4.4	4.5	3.7	3.6	2.8

* 1. Week Before
2. Night Before
3. Morning of
4. Arrival at Building
5. Dressing
6. Warming Up
7. Waiting
8. Event Announced
9. Walking to Starting Point
10. Waiting for Signal to Begin
11. Signal to Begin
12. Beginning of Event
13. Toward End
14. Immediately After